KEYSIGHT TECHNOLOGIES (AGILENT HP)

N8972A

The Keysight (Agilent) N8972A is a high-performance Noise Figure Analyzer (NFA) designed for precise and reliable noise figure and gain measurements from 10 MHz to 1.5 GHz. Ideal for amplifier and frequency-converting device characterization, it features a flexible user interface, color graphical display, and support for multi-contact Smart Noise Sources (SNS) to simplify testing in both R&D and manufacturing environments.

SPECIFICATIONS

General

Interfaces	Dual GPIB (System and LO Control), RS-232 Serial (9-pin), Parallel Printer Port, VGA Monitor Out, External Trigger Input, PS/2 Keyboard, Smart Noise Source (SNS) Front Panel Connector
Display	17 cm (6.6 in) Active Matrix Color LCD, 640 × 480 VGA resolution with graphical trace, table, and meter views
Standard Accessories	Power cord, User's guide, Smart Noise Source (SNS) cable (3 m)

Physical

Power Supply	90 to 264 VAC, 47 to 63 Hz (47 to 440 Hz for 115 VAC), < 300 VA power consumption
Operating Temperature	0 to 55 °C °C
Dimensions (W×H×D)	426 mm × 222 mm × 466 mm mm
Weight	15.5 kg kg

Frequency and Measurement Specifications

Frequency Range	10 MHz to 1.5 GHz
Frequency Resolution	1 Hz
Noise Figure Measurement Range	0 to 35 dB
Noise Figure Instrument Uncertainty	±0.05 dB
Noise Figure Resolution	0.01 dB
Gain Measurement Range	-20 to +40 dB
Gain Instrument Uncertainty	±0.17 dB
Gain Resolution	0.01 dB
Measurement Bandwidths (IF BW)	100 kHz, 200 kHz, 400 kHz, 1 MHz, 2 MHz, 4 MHz
Sweep Points Range	2 to 401 points
Reference Impedance	50 Ω

RF Input and Port Characteristics

Input Connector Type	Type-N (female)
Input VSWR	< 1.4:1 (10 MHz to 1.5 GHz)
Maximum Safe RF Input Power	+15 dBm continuous RF
Maximum DC Input Voltage	±20 V
Noise Source Drive Output Connector	BNC (female)
Noise Source Drive Voltage	28.0 V ± 0.1 V
SNS Connector Type	10-pin multi-contact
Reference 10 MHz Input	BNC female, -5 to +10 dBm nominal
Reference 10 MHz Output	BNC female, > 0 dBm nominal into 50 Ω

Measurement Functions and Features

Measurement Modes	Amplifier, Upconverter, Downconverter, System Downconverter
Averaging Range	1 to 1024
Limit Line Testing	Upper and lower limit lines with pass/fail indicator
Excess Noise Ratio (ENR) Table Support	Multiple tables stored internally, loaded via floppy, or read from Smart Noise Source
Smart Noise Source (SNS) Compatibility	Compatible with Agilent/Keysight N4000 series smart noise sources
Display Formats	Graph, Table, Meter

Connectivity and Interfaces

System GPIB Port	24-pin IEEE-488 female
LO Control GPIB Port	24-pin IEEE-488 female (dedicated for external LO control)
RS-232 Serial Port	9-pin D-sub male
Parallel Printer Port	25-pin D-sub female
VGA Monitor Output	15-pin D-sub female (rear panel)
External Trigger Input	BNC female (rear panel)
Keyboard Interface	PS/2 style 6-pin mini-DIN

System and Display Specifications

Display Type	Active matrix color LCD
Display Size	14 cm (5.7 in)
Display Resolution	640 × 480 pixels
Internal Memory Storage	30 trace/state registers
Removable Storage Type	3.5-inch 1.44 MB floppy disk drive
Save/Recall Configurations	Supported (states and traces)
Warm-up Time	1 hour

Power and Environmental Specifications

AC Power Input Voltage	90 to 264 VAC
AC Power Line Frequency	47 to 63 Hz (47 to 440 Hz for 115 VAC)
Power Consumption	< 300 W
Operating Temperature Range	0 to 55 °C
Storage Temperature Range	-40 to 75 °C
Operating Altitude	Up to 4,600 m
Storage Altitude	Up to 15,200 m
Relative Humidity Range	Up to 95% RH at 40 °C

Physical and Mechanical Characteristics

Form Factor	Benchtop / Rackmount (4U)

Regulatory, Compliance, and Standards

Electromagnetic Compatibility	Complies with EMC Directive 89/336/EEC, CISPR 11, EN 55011 Class A
Safety Certifications	Conforms to CSA C22.2 No. 1010.1, IEC 61010-1, EN 61010-1

Frequency

Tuning Accuracy	±(frequency × reference error + 100 kHz)
Standard Frequency Reference Temperature Stability	±1 × 10^-6 (0 °C to 55 °C)
Standard Frequency Reference Aging Rate	±2 × 10^-6 per year
Option 1D5 Frequency Reference Temperature Stability	±1 × 10^-8 (0 °C to 55 °C)
Option 1D5 Frequency Reference Aging Rate	±1 × 10^-7 per year

Performance

Instrument Noise Figure	< 10 dB (10 MHz to 1.5 GHz)

Storage & Memory

ENR Table Storage Capacity	Up to 39 tables (up to 80 points per table)
Internal Non-Volatile Memory File Capacity	Up to 30 traces, states, or limit lines

Connectivity & Control

Command Language	SCPI (Standard Commands for Programmable Instruments)
Printer Compatibility	PCL3 and PCL5 compatible printers via parallel port
Supported External Local Oscillators	Agilent ESG, PSG, 8370, 8360, 8340, 8648 series, and HP 8673

Measurement

Sweep Types	Linear, List, Spot Frequency
Loss Compensation	Before (Input) and After (Output) DUT loss compensation supported with fixed or table-based values

Display

Marker Functions	4 active markers with delta, marker-to-peak, marker-to-minimum, and marker search
Trace Displays	2 concurrent traces (configurable for Noise Figure, Gain, Teff, Y-Factor, or ENR)

Options

Option 1D7	50 to 75 ohm matching pad (for 75 ohm measurements)
Option A6J	ANSI Z540 compliant calibration
Option UK6	Commercial calibration certificate with test data

TECHNOLOGY

Superheterodyne Receiver with Digital Signal Processing

APPLICATIONS

Noise Figure and Gain Characterization of Amplifiers and Converters